

IN THE CLAIMS:

Claims 1-20 (canceled)

21. (New) A method, comprising:

performing an on-line measurement of a water fraction in a multi-phase flow of a multi-phase mixture in a pipe by measuring at resonance impedances of coils disposed about said pipe, said impedances varying as a function of a composition of conducting fractions present in the flow, and by employing said coils comprising:

a first coil including a first number of turns, said first coil optimized for measuring a continuous mixture of oil/gas, and

a second coil including a second different number of turns, said second coil optimized for measuring a continuous mixture of water, wherein

said coils are disposed in operation on an outer surface of said pipe, such that the coils are arranged so as to be driven at resonant frequencies of said coils in operation,

wherein losses arising in the coils at resonance are determined by alternating from one of the coils to another thereof.

22. (New) The method as claimed in claim 21, comprising employing a computer simulation algorithm for generating a view of the water fraction over a cross-section of the pipe based upon a mathematical model of magnetic fields generated by the coils.

23. (New) A method as claimed in claim 21, comprising at any given moment of time, operating one of the plurality of coils to function as a transmitting coil to generate a magnetic field, and employing the other coil as a detector coil for detecting a reduction of the magnetic field and generating a view of a region of the pipe whereat the magnetic field is low and thereby indicative of a region including water.

24. (New) The method as claimed in claim 21, comprising operating two of the coils at mutually different frequencies for compensating for variations due to water content and thereby determining the water content.

25. (New) The method as claimed in claim 21, wherein at least one coil winding is implemented using cable comprising individually insulated wires or conductors.

26. (New) The method as claimed in claim 21, wherein at least one coil winding is implemented using copper strips which are formed into a thickness which is less than a skin-depth effect of the magnetic fields into the flow through the pipe.

27. (New) The method as claimed in claim 21, wherein at least one of the coils is implemented using flat copper conductor strips having a thickness of 40 μm .

28. (New) The method as claimed in claim 21, wherein the coils are arranged in operation to operate at resonant frequencies in a range of 2 to 8 MHz.

29. (New) The method as claimed in claim 21, comprising employing a resonance frequency of 5.5 MHz for the coils in order to achieve a magnetic field penetration depth of substantially 10 cm into the flow.

30. (New) The method as claimed in claim 21, comprising employing a multi-turn coil for at least one of said coils which is sensitive to water content over a whole region of the pipe.

31. (New) A device, comprising:

a first coil with a number of windings, said first coil optimized for measuring in operation a mixture of oil/gas flowing through a pipe; and

a second coil with a different number of windings, said second coil optimized for measuring in operation a continuous mixture of water flowing through the pipe, such that

the device is operable to provide an on-line measurement of a water fraction in the multi-phase flow by measuring coil impedances at resonance, said impedances varying in response to a proportion of conducting fraction present in the flow through the pipe, wherein

said first coil and said second coil are arranged on an outside surface of the flow-conducting pipe for operating at resonance.

32. (New) The device as claimed in claim 31, wherein loss of power at resonance associated with an alternating magnetic field is measured for one coil at a time.

33. (New) The device as claimed in claim 31, wherein a simulation algorithm is employed for generating a view of a water distribution flowing in a cross-section of the pipe, said simulation based upon a mathematical model of magnetic fields generated by the coils in operation.

34. (New) The device as claimed in claim 31, wherein, during operation of the device, one at a time of the first coil and the second coil is arranged for functioning as a transmitting coil for generating a magnetic field penetrating into the flow through the pipe, and at least one other coil of said first coil and said second coil is employed as at least one receiving coil for use in detecting a reduction in the magnetic field coupled in operation from the at least one transmitting coil to the at least one receiving coil and thereby reconstructing a view of a region of the pipe having reduced magnetic field penetration, said region corresponding to regions including water.